

The Distribution of Pleistocene Vertebrates on the Eastern Darling Downs, Based on the Queensland Museum Collections

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(communicated by M.L. Augée)

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Pleistocene tetrapods have been collected from the eastern Darling Downs of Queensland for about a century and a half. A search of the registers and audit of the collections permits a set of faunal lists to be compiled for specific localities for the first time. Among the tentative conclusions — tentative because of lack of control for collecting bias in the past, among other factors — are the following. The eastern Darling Downs seems to have had a uniform vertebrate fauna. Few taxa are found at many localities, and these uncommon taxa were widespread and either actually rare when alive or subject to preservational bias. Sthenurine kangaroos were less common than macropodines. Some taxa, including monotremes, ninja turtles and lungfish seem to actually have been rare when alive. Crocodiles seem to have been more common and diverse in the northwestern (Dalby) region of the eastern Downs. Dromornithid birds, medtsoine snakes and ziphodont crocodilians seem to have been absent altogether.

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INTRODUCTION

Historical background

Pleistocene fossils have long been known from the Darling Downs. Australian Pleistocene fossils were first brought to the attention of the scientific world by discoveries in central New South Wales around 1830. Although the Darling Downs was not settled until 1840, Thomas Mitchell had already collected material from the Downs by 1842 (Owen, 1877:240). From that period to 1870 further fossils were found and are included in Owen (1877), who also published an extract of a letter from Leichhardt describing the Downs and the occurrences of fossils there (p. 241, also included in Bennett, 1876). About 25% of the Australian fossil marsupials in the British Museum noted in Lydekker (1887), 236 of the 835 entries, come from the Darling Downs. This is a minimal estimate as some entries for material collected by Bennett are located only as "Queensland" and since Bennett, and his employees, did much collecting on the Downs (Bennett 1876) some of this material probably derives from the Downs. In fact, the area of the Downs that produced fossils as given by Bennett is basically the same as that recognised now, except that it has been extended southeast to include Freestone Creek and Warwick. However, Bennett noted that few bones had been found in the Dalby region and nothing was reported from that area in Lydekker (1887). In spite of this long history, the only attempt to present an overall picture of the region during the Pleistocene is that of Bartholomai (1976).

Geography

The Darling Downs comprises low, rolling hills and plains in southeastern Queensland bounded by the Great Dividing Range on the northeast. It extends from the Bunya Mountains (and the Main Range to their south), south to the granite belt at the border with New South Wales, west to the Herries Range and the hilly country west of the Condamine and north to the hills of the Dividing Range (French, 1989). Topographically the land gradually descends from the hills, slopes and valleys of the Main Range in the east, to the plains of the Condamine in the west. In the early nineteenth century the Downs was covered with grass and herbs, with open woodland on the hills (Leichhardt in Owen, 1877). The fossil-bearing part of the Darling Downs is a roughly rectangular region about 200 km long by 80 km wide orientated with its long axis parallel to the Great Dividing Range, that is northwest to southeast (Fig. 1). The region east of the Condamine is known as the eastern Darling Downs, and provides a Pleistocene fauna, whilst the area to the west (including Chinchilla) is the western Downs; the Pliocene Chinchilla fauna is sometimes known as the western Downs fauna.

This study is restricted to the Darling Downs east from Macalister and the Condamine River, and hence the term 'Downs' as used here refers to the eastern Darling Downs not the Chinchilla region or the trans-Condamine portion, with two exceptions. The two Pleistocene localities west of the Condamine River (Kupunn and Boiley's property), so technically not on the eastern Downs, are included. The sites discussed are given in Fig. 1, except for a few that can no longer be located.

Stratigraphy

Woods (1960) provided an overview of the eastern Downs Pleistocene sediments. They consist largely of dark clays, sands and grits derived from the basalts of the Dividing Range, although the sands may also derive from weathering of the underlying Mesozoic beds (Gill, 1978). Calcareous nodules are common and carbonate lenses may be found. Judging from the discoveries of fossils in wells, the fossiliferous sediments are at least 50 metres deep in places but, as pointed out by Bartholomai (1976), these are probably of Pliocene age at that depth. Pleistocene sediments are, however, at least 42 metres thick in the northwest (Bennett, 1872). The fossils generally derive from the dark clay soils but, especially in the northwest along the Condamine, may also be abundant in the yellowish quartz sands.

Macintosh (1967) and Gill (1978) gave a stratigraphy of the region between Kings and Dalrymple Creeks introducing the 'Toolburra Silt' and overlying 'Talgai Pedoderm' and 'Ellinthorpe Clay', names which have not subsequently seen general use. Gill gave a chronology of depositional events in the Dalrymple Creek region. The Toolburra silt was deposited with brief intervals of lower energy (marked by clay deposition) and higher energy (marked by sand) flows. This deposition was followed by a dry period that oxidised the Toolburra, and produced some carbonate nodules about 26,000 years old. The Talgai and Ellinthorpe were then deposited, and record periods of dryness and flooding respectively. Gill interpreted the climate as having generally been wetter than at present. Macintosh suggested that the intermediate and sporadically occurring 'Talgai Fossil Soil' was deposited about 12,000 years ago, based on carbonate dates from the Toolburra and Ellinthorpe. Gill provided dates for Kings Creek sites as old as 40,000 years. These two workers made the only attempts at dating the Downs fossils or deposits.

Gill discussed the dates based on the carbonate nodules (and Gill reports that most dating laboratories were reticent about using these), although in his Fig. 2 he indicated that comparable dates were also obtained from charcoal (Gill, 1978). Some dates were also derived from bone and shell according to the figure. Terrestrial carbonates are now regarded as the least reliable material for radiocarbon dating with whole bone and shells not greatly better, but charcoal is regarded as probably the best (inorganic) material for



Figure 1. Pleistocene fossil localities of the eastern Darling Downs. The diamonds represent selected major towns (four of which are also localities) and the dots (other) localities. The Condamine River and major creeks are also shown. By region, the localities are: **Dalby region**: 1, Jimbour; 2, Brimblecomb's and Jimbour Ck. c. 1.5 km S of Jimbour; 3, Pirrinuan and Jimbour Ck. c. 4.5 km S of Jimbour; 4, 'Wyoming'; 5, c. 3 km downstream from 'Armour' and 'Darrington'; 6, Macalister; 7, 'The Myalls'; 8, Boileys'; 9, Kaimkillenbun; 10, 'Crystal Brook'; 11, Mocatta's Corner; 12, Kapunn; 13, Loudon's bridge; 14, 'Terri'; and Dalby. **Cecil Plains region**: 15, 'Cardoch'; 16, 'Springvale'; 17, St. Ruth; 18, Irongate; 19, Bongen; 20, 'Cecil Downs'; 21, Braemar. **Toowoomba region**: 22, Balgowan; 23, Goombungee; 24, Oakley; 25, near Kingsthorpe (Gowrie Ck.); 26, Kingsthorpe (Westbrook Ck.); 27, Gowrie; 28, Wellcamp; 29, 'Eton Vale'; 30, Cambooya; 31, 'Harrow'; 32, 'Woodstock' and 'Cowarrrie'; and 33, Greenmount. **Clifton region**: 34, Hirstglen; 35, 'Ravensthorpe'; 36, Brown's, Bell's, 'Greenfields' and Pilton; 37, 'Manapouri'; 38, Pearson's and Budgie Creek; 39, Nobby; 40, 'Bundah'; 41, Clifton; 42, Sutton's; 43, College Green; 44, O'Mara's bridge; 45, Spring Creek; 46, Talgai; 47, 'Ebley'; 48, 6.5 km W of 'Goomburra'; 49, 'Goomburra'; 50, Eastwill's; 51, Freestone; 52, Yangan. In addition the locality at Gore is also shown. Not all of these localities are known with comparable accuracy, e.g., 'Ebley' cannot now be located, other than that it was near Allora, so the dot marks Allora. Glengallen Plains could not be located. The regions defined in the text are shown by dashed lines.

dating (Meltzer and Mead, 1985). However the strength of the association of the charcoal (and shells and nodules) with the bones is not given. In view of these considerations it is very desirable to replicate these dates.

Aims of this work

This study was intended to achieve five aims:

- 1). to provide a general introduction to the Downs and its fossils for paleontologists,
- 2). to collect together the data in the Queensland Museum on vertebrate fossils from the eastern Downs,
- 3). to test regionalism in the region,
- 4). to check whether there was one, or more, local fauna, and finally,
- 5). to see if there were any interesting conclusions to be drawn from the previously uninspected data.

It has been generally assumed that the distribution of fossil taxa on the eastern Downs is uniform, i.e. that there is no regionalism. Because of the importance of this area for the understanding of Pleistocene Australia, it is desirable to check this assumption. This study was undertaken in part in response to the comment of Archer (1984) that eastern Darling Downs local fauna might actually be more than a single fauna. And because the fauna is undated, it has also been assumed that the fossils were all more or less of the same age, although admittedly several workers have emphasised that this may not be the case. Dating the material and taphonomic observation, such as whether the sites represent high or low energy deposition, unfortunately cannot be addressed here. Even so it is clear that some sites, e.g. Sutton's and Pearson's, seem to represent low energy deposition while others, e.g. 'Bundah', had at least some episodes of high energy deposition.

Caveats of this work

Several other caveats of this study must be noted. It is restricted to the eastern Downs and is based only on material (including casts) in the Queensland Museum collections. This is probably the largest collection of eastern Downs material, and so lends confidence to the conclusions, but still the study is indicative rather than comprehensive. In view of the large number of specimens involved, by and large the collection identifications were not verified but simply accepted. The mammalian nomenclature has been updated following Archer et al. (1984). However, all register entries were checked in a thorough audit of all specimens not presently on loan.

In view of the lack of taxonomic revision of Pleistocene diprotodontids (now underway by B. Mackness) these have been put into three categories: identifications as *Diprotodon australe*, *D. australis* and *D. optatum* are given here as "*Diprotodon*, large form"; *Diprotodon minor* as "*Diprotodon*, small form", and all other, non-*Diprotodon* diprotodontids as "small diprotodontids" (which probably includes several species). Likewise crocodylians (almost invariably recorded as *Pallimnarchus pollens*) have been given as "crocodylian" except where diagnostic features have been preserved. Chelonians, unless clearly referable to the Meiolaniidae or the Trionychidae, have been given as chelids.

Similarly locality identifications have been assumed to be accurate. Some of the early localities, such as 'Gowrie' or 'Pilton', probably refer to regions rather than to discoveries at those specific locations. Hence some taxa in the lists for these localities may actually be referable to other, more specific localities included here such as, e.g., Brown's property at Pilton. Thus some taxa may be included in the wrong lists, or some

of the localities given as separate may be identical. For much of the early work this would seem prohibitively difficult or impossible to determine now, and it is hoped that this does not greatly alter the conclusions. It should be remembered that these lists are lists of fossils found at the localities. Faunal lists, of which taxa lived in these regions, may be compiled from the lists of fossils but we have not done so. Thus discrepancies between lists for nearby localities reflect differences in the fossils (so far) found, but do not necessarily imply differences in the kinds of animals that lived there.

Most sites have not been systematically collected, and collecting before 1970 was probably restricted to collecting vertebrates of moderate to large size, about the size of *Sarcophilus* and larger. Recently, systematic collecting has been done at some sites, specifically Sutton's, Pearson's, O'Mara's Bridge and 'Bundah'. The last site, 'Bundah', has been exhaustively collected including everything uncovered at the locality since its discovery.

Because of the lack of control over early collecting and other constraints a detailed statistical analysis of the faunal lists is unwarranted. Such an analysis would seem to provide an uncomfortably large possibility of 'garbage in, garbage out'. Therefore only a general set of suggested conclusions — working hypotheses — based on inspection of the data for the distribution of Pleistocene taxa on the eastern Downs is presented. A list of the tetrapod material in the British Museum in the late 19th century from the eastern Downs localities, taken from Lydekker (1887, 1888, 1889) but with the nomenclature updated, is given in the Appendix 1. Since there has not been much collecting on behalf of the British Museum on Downs since then, this probably gives a reasonably complete list of their eastern Downs collection.

FOSSIL LISTS FOR EASTERN DARLING DOWNS LOCALITIES

Synonymies from Archer, et al., (1984), Ingram, (1990), Van Tets and Rich (1990). The number in parentheses before most localities is the locality number in Fig. 1. Note that nearby localities are not individually represented by dots on the figure, and that imprecise localities, such as "Jimbour Creek", and major towns, such as Warwick, are not numbered. The number in parentheses after the locality name gives the number of taxa found at that locality.

DALBY Region: 20 localities + "Jimbour Creek"

Site 1 — Jimbour (2):

Macropodinae

Macropus ?ferragus

Protemnodon anak

Site 2 — Jimbour Ck., c. 1.5 km S of Jimbour (1):

Diprotodontidae

Diprotodon, large form

Site 2 — Brimblecomb's property, Jimbour Creek (3):

Macropodinae

Macropus titan

Protemnodon anak

Diprotodontidae

Diprotodon, large form

Site 3 — Jimbour Ck., c. 4.5 km S of Jimbour (1):

Sthenurinae

Procoptodon goliah

Site 3 — Pirrinuan, Jimbour Creek (1):

Sthenurinae

*Troposodon minor***Site 4** — 'Wyoming' (2):

Macropodinae

macropod

Diprotodontidae

?Diprotodon, large form**Site 5** — Condamine River, c. 3 km downstream from 'Armour' (2):

Diprotodontidae

Diprotodon, large form

small diprotodontid

Site 5 — near 'Darrington', Condamine River (1):

Diprotodontidae

Diprotodon, large form**Site 6** — Macalister, Condamine River (16):

Vombatidae

Phascolomys sp.*Vombatus* sp.

Macropodinae

*Macropus ferragus**Macropus pearsoni**Protemnodon anak**Protemnodon roechus*

Sthenurinae

*Procoptodon pusio**Troposodon minor*

Diprotodontidae

Diprotodon, small form*Diprotodon*, large form

small diprotodontid

Palorchestidae

Palorchestes azael

Crocodylidae

*Crocodylus porosus**Pallimnarchus pollens*

Meiolaniidae

meiolaniid

Chelidae

chelid

Site 7 — 'The Myalls' (and vicinity) (3):

Macropodinae

Protemnodon anak (c. 1 km N.)

Diprotodontidae

Diprotodon, large form

small diprotodontid

Site 8 — Boiley property, near 'Daandine' (1):

Macropodidae

macropod

Site 9 — Kaimkillenbun (3):

Vombatidae

Vombatus sp.

Macropodinae

Protemnodon brehus

Sthenurinae

*Sthenurus andersoni***Site 10** — ‘Crystal Brook’, Myall Creek (2):

Macropodinae

macropod

Diprotodontidae

diprotodontid

Site 11 — Mocatta’s Corner, Bunya Creek (1):

Varanidae

*Megalania prisca***Site 12** — Kupunn (given “Kapunn”) (1):

Vombatidae

*Phascolonus gigas***Site 13** — ‘Greenbank’ (Loudons Bridge) (1):

Diprotodontidae

diprotodontid

Site 14 — ‘Territ’, Oakey Creek (1):

Vombatidae

*Phascolomys medius***Dalby region, Cattle Creek** (9)

Vombatidae

wombat

Hypsiprymnodontinae

Propleopus oscillans

Macropodinae

*Macropus ferragus**Macropus titan**Protemnodon anak**Protemnodon roechus*

Diprotodontidae

Diprotodon, large form

Dasyuridae

Sarcophilus laniarius

Thylacoleonidae

*Thylacoleo carnifex***Dalby** (12):

Vombatidae

Phascolomys magnus

Macropodinae

*Macropus titan**Protemnodon anak**Wallabia indra*

Diprotodontidae

Diprotodon, large form

small diprotodontid

Palorchestidae

Palorchestes azael

Thylacoleonidae

?Thylacoleo carnifex

Dromaiidae

Dromaius sp. cf. *D. novaehollandiae*

Crocodylidae

crocodilian

Varanidae

Megalania prisca

Chelidae

chelid

“Jimbour Creek” (6):

Macropodinae

*Macropus agilis**Macropus titan**Protemnodon anak**Protemnodon roechus*

Diprotodontidae

Diprotodon, large form

Thylacoleonidae

*Thylacoleo carnifex***Myall Creek (1):**

Macropodidae

macropod

‘CONDAMINE RIVER’

Macropodinae

Macropus ferragus

Diprotodontidae

Diprotodon, large form

small diprotodontid

Dromaiidae

Dromaius sp.

Crocodylidae

crocodilian

Varanidae

Megalania prisca

Chelidae

Chelodina sp. (given “*Chelonia*”)**CECIL PLAINS Region: 8 localities****Site 15** — ‘Cardoch’, Condamine River (1):

Macropodinae

*Protemnodon anak***Site 16** — ‘Springvale’, near Tipton (5):

Macropodinae

*Macropus pearsoni**Protemnodon anak*

Diprotodontidae
Diprotodon, small form
 small diprotodontid
 Palorchestidae
Palorchestes azael

Site 17 — St. Ruth (2):

Diprotodontidae
Diprotodon, large form
 Palorchestidae
Palorchestes azael

Site 18 — Irongate (1):

Diprotodontidae
Diprotodon, small form

Site 19 — Bongeen (2):

Macropodinae
Macropus titan
Osphranter altus

Site 20 — ‘Cecil Downs’, Linthorpe Creek(7–8):

Macropodinae
Macropus sp.
Protemnodon roechus

Sthenurinae
Procoptodon sp.

Diprotodontidae
Diprotodon, large form
 small diprotodontid

Thylacoleonidae
Thylacoleo sp.

family not known
 ?bird

Agamidae
 agamid^a

Site 21 — ‘Braemar’, near Southbrook (1):

Diprotodontidae
Diprotodon, large form

Cecil Plains (1):

Diprotodontidae
Diprotodon, large form

^a The condition of the specimen suggests that it may be recent or of different age from the rest of the taxa listed.

TOOWOOMBA Region: 14 localities + “Gowrie Creek”

Site 22 — Balgowan colliery (2):

Macropodinae
Protemnodon anak

Diprotodontidae
Diprotodon, large form

Site 23 — Goombungee (1):

Macropodinae
Protemnodon anak

Site 24 — Oakey, Gowrie Creek (1):

Diprotodontidae

Diprotodon, large form**Site 25** — near Kingsthorpe, Gowrie Creek (1):

Macropodidae

macropod

Site 26 — Kingsthorpe, Westbrook Creek (4):

Macropodinae

*Macropus titan**Protemnodon anak*

Diprotodontidae

Diprotodon, small form*Diprotodon*, large form**Site 27** — Gowrie (25):

Vombatidae

*Phascolomys angustidens**Phascolonus gigas**Vombatus ursinus*

Potoroinae

Aepyprymnus rufescens

Macropodinae

*Macropus agilis**Macropus dryas**Macropus thor**Macropus titan**Onychogalea unguifera**Osphranter altus**Protemnodon anak**Protemnodon brehus**Protemnodon devisi**Protemnodon roechus**Wallabia indra*

Sthenurinae

*Procoptodon pusio**Sthenurus andersoni**Troposodon minor*

Diprotodontidae

Diprotodon, large form

small diprotodontid

Thylacinidae

Thylacinus cynocephalus

Thylacoleonidae

Thylacoleo carnifex

Rallidae

Gallinula mortierii

Crocodylidae

crocodilian

Chelidae

chelid

Site 28 — Wellcamp and vicinity (5):

Macropodinae

Macropus sp.*Protemnodon anak**Protemnodon roechus*

Diprotodontidae

Diprotodon, large form

small diprotodontid

Site 29 — 'Eton Vale' (2):

Macropodinae

Macropus sp.

Diprotodontidae

Diprotodon, large form**Site 30** — Cambooya region (3):

Macropodinae

*Macropus titan**Protemnodon anak*

Diprotodontidae

Diprotodon, large form**Site 31** — 'Harrow' ("Sharrow") (7):

Macropodinae

*Macropus pearsoni**Macropus titan**Protemnodon anak*

Sthenurinae

Troposodon minor

Diprotodontidae

Diprotodon, large formsmall diprotodontid (*Prochoerus celer*)

Crocodylidae

crocodilian

Site 32 — 'Cowarrie', near Southbrook (1):

Diprotodontidae

Diprotodon, large form**Site 32** — 'Woodstock', Hodgsons Creek (4):

Diprotodontidae

Diprotodon, large form

family not known

bird

Varanidae

Megalania prisca

family not known

lizard

Site 33 — Greenmount, Emu Creek (6):

Macropodinae

*Macropus titan**Protemnodon anak*

Sthenurinae

? *Procoptodon* sp.

Diprotodontidae

Diprotodon, large form

Peramelidae(?)

bandicoot

family not known

bird

“Gowrie Ck” (9):

Macropodinae

Macropus sp.*Protemnodon anak**Protemnodon roechus*

Diprotodontidae

Diprotodon sp.diprotodontid (*Sthenomerus charon*)

Dasyuridae

Sarcophilus sp.

Thylacinidae

Thylacinus cynocephalus

Thylacoleonidae

Thylacoleo carnifex

family not known

teleost

Toowoomba (1):

Diprotodontidae

Diprotodon, large form**CLIFTON Region: 25 localities + “Kings Creek”****Site 34** — Longe’s property, Hirstglen (1):

Macropodinae

*Macropus titan***Site 35** — ‘Ravensthorpe’ (19–20):

Vombatidae

Vombatus sp.

Macropodinae

*Macropus agilis**Macropus ferragus**Macropus pan* or *faunus**Macropus piltonensis**Macropus thor**Macropus titan**Osphranter woodsi**Protemnodon anak**Protemnodon ?devisi**Protemnodon roechus*

Sthenurinae

*Sthenurus pales?**Troposodon minor*

Diprotodontidae

Diprotodon, large form

Rallidae

large rail

Ardeidae

Ardea cf. *A. novaehollandiae*

Megapodidae

Progyra gallinacea

Crocodylidae

crocodilian

Varanidae

Megalania prisca

Trionychidae

trionychid

Site 36 — Bell's property, Pilton (1):

Palorchestidae

*Palorchestes parvus***Site 36** — Brown's property, Pilton, Kings Ck. (7):

Macropodinae

*Macropus agilis**Macropus* cf. *M. giganteus**Protemnodon anak**Protemnodon roechus*

Diprotodontidae

Diprotodon, large form

small diprotodontid

Chelidae

chelid

Site 36 — 'Greenfields', Pilton (4):

Vombatidae

Phascolonus gigas

Macropodinae

*Macropus ferragus**Macropus* sp. cf. *M. titan**Protemnodon anak***Site 36** — Pilton, Kings Creek (17):

Vombatidae

*Phascolomys angustidens**Phascolonus gigas**Vombatus ursinus*

Macropodinae

*Macropus ferragus**Macropus titan**Protemnodon anak**Protemnodon roechus*

Sthenurinae

Sthenurus andersoni

Diprotodontidae

Diprotodon, large form

Dasyuridae

Dasyurus sp.*Sarcophilus lanarius*

Thylacinidae

Thylacinus cynocephalus

Thylacoleonidae

Thylacoleo carnifex

Ornithorhynchidae

Ornithorhynchus anatinus

Dromaiidae

Dromaius novaehollandiae

Varanidae

Megalania prisca

family not known

teleost

Site 37 — 'Manapouri', Kings Creek (3):

Macropodinae

Macropus titan

Diprotodontidae

Diprotodon, large form

Chelidae

chelid

Site 38 — Budgie Creek (1):

Macropodinae

macropod

Site 38 — Pearson's Locality, Kings Creek (22):

Vombatidae

*Phascolomys medius**Phascolonus gigas*

Macropodinae

*Macropus agilis**Macropus ferragus**Macropus pearsoni**Macropus titan**Onychogalea unguifera**Protemnodon anak**Protemnodon brehus**Protemnodon roechus**Thylogale* sp.

Sthenurinae

*Procoptodon pusio**Procoptodon rapha**Sthenurus andersoni**Troposodon minor*

Diprotodontidae

Diprotodon, large form

Palorchestidae

Palorchestes azael

Dasyuridae

Dasyurus sp.

Thylacinidae

Thylacinus cynocephalus

Phasianidae

quail

Varanidae

Megalania prisca

Plotosidae

*Tandanus tandanus***Site 39** — Nobby (1):

Rallidae

*Gallinula (G. mortierii?)***Site 40** — 'Bundah', Neds Gully (9):

Vombatidae

wombat

Macropodinae

Macropus titan

Sthenurinae

Procoptodon goliah

Diprotodontidae

Diprotodon, large form

Dasyuridae

Sarcophilus sp.

Thylacoleonidae

Thylacoleo sp.

family not known

rodent

family not known

?bird

family not known

?teleost

Site 41 — Clifton, Kings Creek (17):

Vombatidae

Lasiorhinus sp.*Phascolomys* sp.

Macropodinae

*Macropus agilis**Macropus titan**Protemnodon affinis*^c*Protemnodon anak**Protemnodon devisi**Protemnodon roechus**Osphranter altus*

Sthenurinae

*Procoptodon goliah**Procoptodon pusio**Troposodon minor*

Diprotodontidae

Diprotodon, small form*Diprotodon*, large form

small diprotodontid

Thylacoleonidae

Thylacoleo carnifex

Rallidae

*Gallinula mortierii***Site 42** — Sutton's site, Kings Creek (18):

Vombatidae

Phascolonus gigas

Macropodinae

*Macropus titan**Protemnodon roechus*

Diprotodontidae

Diprotodon, large form

Palorchestidae

Palorchestes sp.

Peramelidae(?)

?bandicoot

Dasyuridae

Dasyurus sp.

family not known

?monotreme

family not known

rodent

family not known

bird

Crocodylidae

crocodilian

Varanidae

Megalania prisca

other varanid

family not known

snake

Agamidae

agamid

Chelidae

chelid

family not known

?frog

family not known

teleost

Site 43 — near College Green, Kings Creek (1):

Diprotodontidae

diprotodontid

Site 44 — O'Mara's Bridge, Kings Creek (12):

Macropodinae

*Macropus agilis**Protemnodon anak*

Sthenurinae

*Troposodon kenti**Troposodon minor*

Diprotodontidae

Diprotodon, large form

Dasyuridae

Dasyurus sp.

Thylacoleonidae

Thylacoleo sp.

Crocodylidae

crocodilian

Varanidae

Megalania prisca

other varanid

Chelidae.

chelid

family not known

teleost

Site 45 — near Clifton, Spring Creek (5):

Macropodinae

*Macropus agilis**Macropus ferragus**Macropus titan*

Diprotodontidae

diprotodontid

Thylacoleonidae

*Thylacoleo carnifex***Site 46** — Talgai (1):^d

Macropodinae

*Protemnodon anak***Site 47** — 'Ebley', near Allora (1):

Diprotodontidae

Diprotodon, large form**Site 48** — 6.5 km W. of 'Goomburra' (1):

Vombatidae

Phascolonus sp**Site 49** — 'Goomburra', near Allora (1):

Palorchestidae

Palorchestes sp.**Site 50** — Eastwill's property, Glengallen Creek (1):

Sthenurinae

*Procoptodon goliah***Site 51** — Freestone, Freestone Creek (14):

Vombatidae

*Phascolonus gigas**Vombatus ursinus*

Macropodinae

*Macropus agilis**Macropus titan**Osphranter altus**Protemnodon anak*

Sthenurinae

*Procoptodon goliah**Procoptodon rapha**Sthenurus* sp. (nov.?)

Diprotodontidae

Diprotodon, large form

small diprotodontid

Peramelidae

Perameles sp. (nov.?)

Dasyuridae

Dasyurus sp

Ciconiidae

*Ephippiorhynchus asiaticus***Site 52** — Yangan (given “Yangau”) (1):

Diprotodontidae

Diprotodon, large form**Glengallen Plains** (1):

Vombatidae

*Lasiiorhinus latifrons***“King Creek”:**

Vombatidae

Phascolonus sp.*Vombatus* sp.

Hypsiprymnodontinae

Propleopus oscillans

Macropodinae

*Macropus agilis**Macropus ferragus**Macropus titan**Protemnodon anak**Protemnodon brehus**Protemnodon roechus*

Sthenurinae

*Procoptodon goliah**Procoptodon rapha**Troposodon minor*

Diprotodontidae

Diprotodon, large form

small diprotodontid

Thylacoleonidae

Thylacoleo carnifex

family not known

monotreme

Dromaiidae

Dromaius novaehollandiae

Anatidae

duck

Accipitridae

buteonine (*Taphaetus brachialis*)

Varanidae

Megalania prisca

Meiolaniidae

Ninjemys oweni

Chelidae

chelid

Ceratodontidae

Ceratodus palmeri

Warwick (2):

Diprotodontidae

small diprotodontid

Columbidae

Phaps sp.^b Locality uncertain.^c The label makes clear that this is a reference to the *Macropus affinis* of Owen (1845; cf. Mahoney and Ride, 1975).^d We agree that the human skull wasn't contemporaneous with *Protemnodon* (cf. Gill, 1978).**DISCUSSION****Size bias**

Almost half of the taxa identified in the lists are recorded from only one locality. This obscures any geographical patterns that might be present. Such patterns, if any, are probably not reliable for the small taxa (e.g., birds, *Dasyurus*, bandicoots, rodents, monotremes, small lizards, frogs). Collecting experience, especially at Sutton's site and 'Bundah', suggests that these small forms have been overlooked and actually may have been much more widespread, as would be expected from ecological considerations.

Contrawise any geographical patterns are probably more reliable for the larger forms so suggested conclusions here are restricted (largely) to these large forms.

Regionalisation

In order to discern any geographical patterns the eastern Downs, west to (and including) the region around Macalister, was divided somewhat arbitrarily into four portions (Fig. 1): around Dalby; around Cecil Plains; around Oakey and Toowoomba; and around Clifton and Warwick, respectively called the Dalby, Cecil Plains, Toowoomba, and Clifton regions. Taxa found in each region are given in Appendix 2. The variety of taxa was greatest in the Clifton region, then progressively less in the Toowoomba and Dalby regions and least in the Cecil Plains region. This is proportional to the numbers of localities in each region. There seems to be no obvious indication of regionalization (except possibly for crocodilians as discussed below), so we tentatively suggest that the eastern Darling Downs Pleistocene fauna is a single local fauna.

Rarity

The number of sites at which each taxon was recorded are given in Appendix 3. Of the 68 taxa identified there, only 14 are found at more than five localities and only five (*Macropus titan*, *Protemnodon anak*, *P. roechus*, 'large *Diprotodon*', 'small diprotodontid') at more than 10. Thus there seem to be few widespread taxa and many restricted ones, e.g., *Palorchestes parvus*, *Sthenurus*, *Aepyprymnus*, *Propleopus*, *Onychogalea*, *Osphranter* and *Thylogale* which all seem to have been uncommon or restricted in range. However, this may be misleading as large numbers of fossils have only vague locality data such as "Darling Downs" so, for example, although only a single *P. parvus* is recorded from any specific site, 11 other specimens (without specific locality data) are in the QM collections. This example is the worst, and the other taxa here listed are represented by few or no (*Aepyprymnus*, *Onychogalea*, *Osphranter* and *Thylogale*) other Pleistocene specimens from the Downs in the QM collections. Neither are they recorded (at least from specific localities) by Lydekker (1887).

Although we regard those taxa found at several localities as having been widespread animals on the Pleistocene Downs, "restricted" is used here to indicate taxa found at few localities. We may interpret these taxa as having been uncommon, having had small population sizes, and most are actually represented by few specimens in the collections. In fact, even the creatures with widespread distributions are represented by few specimens, and the minimum number of individuals represented per locality is usually 1. Whether the animals represented by uncommon fossils were rare in the sense of today's rare animals is a matter requiring taphonomic analysis.

Were these restricted taxa found all over the Downs in low numbers (actually rare) or were they perhaps in large numbers restricted to specific locations, i.e., localized? If they were widely distributed in low numbers we might expect to find them preferentially at localities with large numbers of taxa (ranging to 25 taxa per locality), i.e., the larger sample sizes. Of these restricted taxa (defined in this context as those found at 1–5 localities) some, such as *Macropus thor* and *Onychogalea unguifera* are indeed found only in the large sample sizes. Only one, *Phaps* sp., is found only in a small sample size (<5) but others, such as *Procoptodon goliath* and *Megalaniania prisca*, are found in both large and small sample sizes. Being a bird *Phaps*, we think, was probably subject to both preservational and collecting bias. Hence it may well have been more common than here indicated. So it seems likely there weren't any localized populations but we would recommend more systematic collecting, especially in the western regions, before drawing any further conclusions on this point.

Only a single human fossil, the Talgai skull, has been found on the Downs. Even human artifacts contemporaneous with the megafauna are probably nonexistent as there is only a single, unconfirmed report of their existence (Klaatsch, 1904), and we have seen none in our collecting on the Downs. This may imply that the Downs fossils and deposits date to a time before the entry of humans into Australia. Gill (1978) thought the Talgai skull clearly postdated the extinct marsupials. Ninja turtles are also uncommon, which is unexpected in view of their size and exuberant armor. In addition to the holotype of *Ninjemys oweni*, their presence is confirmed by a single meiolaniid vertebra from near Macalister. This suggests that they were widespread — the holotype is from "Kings Creek" — but quite rare.

Pliocene taxa

Several species considered to be Pliocene (e.g., by Archer, *et al.*, 1984) have been recorded in the QM collections from the eastern Downs. These include *Macropus dryas*, *Osphranter woodsi*, *Protemnodon devisi*, *Euryzygoma dunense* and possibly *Macropus pan*. Four possibilities exist: i) there are some unrecognized Pliocene deposits in the eastern Downs; ii) some Pliocene species persisted, perhaps in reduced numbers, into the Pleistocene, iii) they are simply mis-identified; and iv) the locality data are incorrect. Even though detailed Pleistocene stratigraphy has yet to be carried out on the Downs, the fact that all of putative Pliocene taxa derive from localities with large sample sizes (17–25 taxa) suggests that the first possibility is unlikely. In order to very roughly assess the likelihood of misidentification, we looked at the specimens of *Euryzygoma* reported. These included an incomplete temporal from Macalister, nine isolated and worn incisors (some of which may be macropod) from Freestone Ck. and Dalby and two dentaries with very worn cheek teeth from Gowrie. Since we are not aware that diprotodont genera can be accurately distinguished from fragmentary cranial elements or the roots of incisors we feel that these identifications may be in error. From the amount of wear on the teeth — which are usually considered the more diagnostic structures in mammals — in the Gowrie specimens we hesitate to take these to be confidently identifiable. As for the remainder of the taxa concerned, we cannot distinguish between the remaining possibilities at this time, but our experience with the reported *Euryzygoma* material suggests that misidentification cannot be ruled out as an explanation.

Specific groups

Looking at the specific groups present on the eastern Downs, further comments are warranted. Of the wombats, *Phascolonus* was the most widespread. This may be the result of its large size, but the smaller *Vombatus* is also (moderately) widespread, suggesting that both of these forms were actually prominent in the Downs mammalian fauna.

Potoroines and hypsiprymnodontines seem to have been rare but are also small, so caution is advised. Of course if *Propleopus* was a predator, as has been suggested (Archer and Flannery, 1985), its rarity is to be expected. Large macropodids, on the other hand, were common; most sites have *Macropus titan*, *Protemnodon anak* and *P. roechus*. Other macropods are found at fewer than ten sites, although *M. agilis*, *M. ferragus* and *Troposodon minor*, found at eight to nine sites, are reasonably common. Sthenurines (except *T. minor*) are found at fewer sites, suggesting that they (even *T. minor*) were generally rarer than macropodines. But their presence does suggest that some of the eastern Downs was wooded to a greater extent than when visited by Leichhardt in the early 19th century.

Of the diprotodontids, the 'large *Diprotodon*' is found at almost all sites ranging across the Downs up and into the dividing range. It is approximately eight times as common as the smaller form, which may imply that the smaller individuals were juveniles or simply that the large and robust bones of larger animals were more easily preserved and discovered than those of the smaller form. The smaller diprotodontids are still poorly understood taxonomically so no conclusions about them are presently warranted.

Palorchestids seem only moderately widespread and monotremes seem to have been rare. This is supported by our field experience — very few monotremes have been found after much searching by both professionals and amateurs. As mentioned previously carnivores are expected to be rare. The most widespread were *Thylacoleo* and *Megalanina*, the latter confirming the significant role of reptilian predators in Australian Pleistocene faunas.

Teleost fossils are rare and restricted to the eastern and southeastern regions. But in our opinion, based on collecting experience, this is due to collecting bias. Teleost fossils have been found at all of the systematically collected localities, except 'Bundah' (which produced no certain fossils of aquatic or amphibious animals at all), and almost none of the other sites. Dipnoans are a different matter, and have been known from the Pliocene at Chinchilla since the nineteenth century. Those from the eastern Downs belong to the same species, *Ceratodus palmeri*, as that from Chinchilla and are all recorded from Kings Creek. We suspect that this accurately reflects their distribution when alive, although why they have not been recorded from deposits on the Condamine, where they lived during the Pliocene, is unknown. It may be that the Kings Creek population was a relict population during the Pleistocene.

Absent taxa

Several forms that might reasonably have been expected are not in fact present in the QM collections nor, to our knowledge, in any other collections from the eastern Downs. Since these are animals of moderate to large size, we are reasonably confident that they were actually absent, although we don't know why. These are madtsoine snakes (such as *Wonambi*), dromornithid birds and ziphodont crocodilians. The first two might be expected on the basis of size — both emus and smaller snakes have been found — and shed teeth of ziphodont crocs might be expected to have been collected, even if mistaken for teeth of *Megalanina*. But none are present.

Possums do not occur in the QM (or London) collections from the Downs. This might be attributed to their small size, except that they have not been found at systematically collected localities nor in searches specifically for them (Godthelp, pers. comm. 1995).

Crocodylians are more common and diverse in the Dalby region and this is borne out by field experience. So while crocs were not actually absent in eastern regions they seem to have been decidedly rare. *Megalania*, on the other hand, seems to have been widely spread. It is not known from the Cecil Plains region, but this may be simply a matter of the small sample from that region.

SUMMARY

There is presently no evidence for faunal regionalization or the existence of more than a single local fauna in the eastern Darling Downs Pleistocene. Few taxa (14 out of 63) are found at more than five (of 68) localities and even fewer (five) at more than 10. The uncommon taxa seem to have been widespread over the Downs, and may have had small population sizes, or may have been subject to preservational bias. Sthenurines seem to have been less common than macropodines, but their presence suggests that the Pleistocene Downs did support some woodland. Ninja turtles almost certainly had small populations. Species considered to be Pliocene are recorded, but whether they represent remnant populations or simply mistakes is unknown. The large form of *Diprotodon* was widespread and seems to have been common, whereas palorchestids were less common, and monotremes seem to have been rare. The most common carnivorous forms were *Megalania* and *Thylacoleo*. Crocodiles seem to have been most common and diverse in the Dalby region. The rarity of teleost fossils is probably due to collecting bias, but lungfish seem to have been restricted to Kings Creek, perhaps as a relict population. There is no indication that possums, ziphodont crocodiles, dromornithid birds or madtsoine snakes inhabited the Pleistocene Downs.

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APPENDIX 1: FAUNAL LISTS FROM LYDEKKER (1887, 1888, 1889):

Clifton list includes 'Clifton Plains' and Kings Creek list, excludes those given as 'King Ck., Clifton'

Condamine River:

Diprotodontidae

Diprotodon, large form
small diprotodontid

Thylacoleonidae

Thylacoleo carnifex

Crocodylidae

crocodilian

Varanidae

Megalanian prisca

CECIL PLAINS REGION:**St. Ruth:**

Diprotodontidae

Diprotodon, large form

Vombatidae

Phascolumys medius
Phascolonius gigas
Vombatus ursinus

Macropodinae

Macropus ferragus
Osphranter altus
Protemnodon brehus
Protemnodon roechus

Sthenurinae

Procoptodon rapha
Troposodon minor

TOOWOOMBA REGION:**'Eton Vale':**

Vombatidae

Phascolumys magnus
Phascolonius gigas

Macropodinae

Osphranter altus
Protemnodon roechus

Diprotodontidae

Diprotodon, large form

Thylacoleonidae

Thylacoleo carnifex

Chelidae

chelid

Gowrie:

Vombatidae

Phascolumys magnus
Phascolumys medius
Phascolonius gigas
Vombatus ursinus

Macropodinae

Macropus titan
Osphranter altus
Osphranter robustus
Protemnodon anak
Protemnodon roechus

Sthenurinae

Procoptodon rapha
Sthenurus atlas

Diprotodontidae

Diprotodon, large form
small diprotodontid

Dasyuridae

Dasyurus viverrinus
Sarcophilus laniarius

Thylacoleonidae

Thylacoleo carnifex

Crocodylidae

crocodilian

Varanidae

Megalanian prisca

Hodgsons Creek:

Thylacoleonidae

Thylacoleo carnifex

Westbrook Creek:

Chelidae

chelid

CLIFTON REGION:**Clifton:**

Vombatidae

Phascolonius gigas

Macropodinae

Macropus giganteus
Macropus titan
Protemnodon brehus
Protemnodon roechus

Sthenurinae

Procoptodon pusio

Diprotodontidae

Diprotodon, large form

Crocodylidae

crocodilian

Kings Creek:

Vombatidae

Phascolonius gigas

Macropodinae	Varanidae
<i>Protemnodon brehus</i>	<i>Megalania prisca</i>
Diprotodontidae	Meiolaniidae
<i>Diprotodon</i> , large form	<i>Ninjemys oweni</i>
Thylacoleonidae	
<i>Thylacoleo carnifex</i>	

APPENDIX 2

Distribution of taxa on the eastern Darling Downs.

DR = Dalby region; CPR = Cecil Plains region; TR = Toowoomba region; CR = Clifton region.

	DR	CPR	TR	CR
<i>Lasiorhinus latifrons</i> /sp.				X
<i>Phascolomys angustidens</i>			X	
<i>P. medius</i>			X	X
<i>Phascolonus gigas</i> /sp.		X	X	X
<i>P. magnus</i>	X			
<i>Vombatus ursinus</i>			X	X
<i>V. sp.</i>	X			
<i>Aepyprymnus rufescens</i>			X	
<i>Propleopus oscillans</i>	X			X
<i>Macropus agilis</i>	X		X	X
<i>M. dryas</i>			X	
<i>M. ferragus</i>	X		X	X
<i>M. giganteus</i>				X
<i>M. pan</i> (or <i>faunus</i>)				X
<i>M. pearsoni</i>	X	X	X	X
<i>M. piltonensis</i>				X
<i>M. thor</i>			X	X
<i>M. titan</i>	X	X	X	X
<i>Onychogalea unguifera</i>			X	X
<i>Osphranter altus</i>		X	X	X
<i>O. woodsi</i>				X
<i>Procoptodon goliath</i>	X			X
<i>P. pusio</i>	X		X	X
<i>P. rapha</i>				X
<i>Protemnodon anak</i>	X	X	X	X
<i>P. affinis</i>				X
<i>P. brehus</i>	X		X	X
<i>P. devisi</i>			X	X
<i>P. roechus</i>	X	X	X	X

<i>Sthenurus andersoni</i>	x		x	x
<i>S. pales</i>				?
<i>Thylogale</i> sp.				x
<i>Troposodon kenti</i>				x
<i>T. minor</i>	x		x	x
<i>Wallabia indra</i>	x		x	x
<i>Diprotodon</i> small form	x	x	x	x
<i>Diprotodon</i> large form	x	x	x	x
small diprotodontid	x	x	x	x
<i>Palorchestes azael</i>	x	x		x
<i>P. parvus</i>				x
<i>Dasyurus</i> spp.				x
<i>Sarcophilus lanarius</i> /sp.	x		x	x
<i>Thylacinus cynocephalus</i>			x	x
<i>Thylacoleo carnifex</i> /sp.	x	x	x	x
<i>Perameles</i> sp.			?	x
<i>Ornithorhynchus anatinus</i>				x
rodent				x
<i>Dromaius novaehollandiae</i>	x			x
<i>Ardea</i> cf. <i>A. novaehollandiae</i>				x
<i>Ephippiorhynchus asiaticus</i>				x
<i>Phaps</i> sp.				x
<i>Progura gallinacea</i>				x
<i>Gallinula mortierii</i>			x	x
duck				x
quail				x
buteonine				x
<i>Crocodylus porosus</i>	x			
<i>Pallimarchus pollens</i>	x			
crocodilian			x	x
<i>Megalanian prisca</i>	x		x	x
varanid				x
agamid		?		x
snake				x
meiolaniid	x			x
chelid	x		x	x
trionychid				x
frog				?
<i>Ceratodus palmeri</i>				x
<i>Tandanus tandanus</i>				x
teleost			x	x

APPENDIX 3

Ranking of taxa (mostly monospecific genera or species) by the number of sites at which they occur. Those sites for which identifications were only to category higher than genus, or to genus for multispecific genera, and "Jimbour Creek", "Condamine River" and "Kings Creek" were excluded, as being too extensive for single localities in this context. 68 localities (not all with taxa identified to genus) are included. Numbers on the right are the total number of taxa found at the sites at which the listed taxa occurred (given only for those that occurred at fewer than 10 sites). *: species recorded as Pliocene in age.

Taxon	No. of sites	No. of taxa from each site
<i>Lasiorhinus latifrons</i> /sp.	2	17, 1
<i>Phascolomys angustidens</i>	2	25, 17
<i>P. medius</i>	2	22, 1
<i>Phascolonus gigas/magnus</i> /sp.	8	25, 22, 18, 17, 14, 4, 1, 1
<i>Vombatus ursinus</i> /sp.	6	25, 19, 17, 16, 14, 3
<i>Aepyprymnus rufescens</i>	1	25
<i>Propleopus oscillans</i>	1	9
<i>Macropus agilis</i>	8	25, 22, 19, 17, 14, 12, 7, 5
<i>M. dryas</i> *	1	25
<i>M. ferragus</i>	7	22, 19, 17, 16, 9, 5, 4
<i>M. cf. M. giganteus</i>	1	7
<i>M. pan</i> (or <i>faunus</i>) *	1	19
<i>M. pearsoni</i>	4	22, 16, 7, 5
<i>M. piltonensis</i>	1	19
<i>M. thor</i>	2	25, 19
<i>M. titan</i>	21	—
<i>Onychogalea unguifera</i>	2	25, 22
<i>Osphranter altus</i>	4	25, 17, 14, 2
<i>O. woodsi</i> *	1	19
<i>Procoptodon goliath</i>	5	17, 14, 9, 1, 1
<i>P. pusio</i>	4	25, 22, 17, 16
<i>P. rapha</i>	2	22, 14
<i>Protemnodon affinis</i>	1	17
<i>P. anak</i>	27	—
<i>P. brehus</i>	3	25, 22, 3
<i>P. devisi</i> *	2–3	25, 19?, 17
<i>P. roechus</i>	12	—
<i>Sthenurus andersoni</i>	4	25, 22, 17, 3
<i>S. pales</i>	1?	19
<i>Thylogale</i> sp.	1	22
<i>Troposodon kenti</i>	1	12
<i>T. minor</i>	8	25, 22, 19, 17, 16, 12, 7, 1
<i>Wallabia indra</i>	2	25, 12
<i>Diprotodon</i> small	5	17, 16, 5, 4, 1
<i>Diprotodon</i> large	39	—
small diprotodontid	15	—

<i>Palorchestes azael</i>	5	22, 16, 12, 5, 2
<i>P. parvus</i>	1	1
<i>P. sp.</i>	2	18, 1
<i>Dasyurus sp.</i>	5	22, 18, 17, 14, 12
<i>Sarcophilus lanarius/sp.</i>	4	17, 9, 9, 9
<i>Thylacinus cynocephalus</i>	4	25, 22, 17, 9
<i>Thylacoleo carnifex</i>	9	25, 17, 17, 12, 9, 9, 7, 5, 4
<i>Perameles sp./bandic.</i>	3	18, 14, 6
<i>Ornithorhynchus anatinus</i>	1	17
rodent	2	18, 9
<i>Dromaius novaehollandiae/sp.</i>	2	17, 12
<i>Ardea cf. A. novaehollandiae</i>	1	14
<i>Ephippiorhynchus asiaticus</i>	1	19
<i>Phaps sp.</i>	1	2
<i>Progura gallinacea</i>	1	19
quail	1	22
<i>Gallinula mortierii/sp.</i>	3	25, 17, 1
<i>Crocodylus porosus</i>	1	16
<i>Pallimnarchus pollens</i>	1	16
crocodilian	6	25, 19, 18, 12, 12, 7
<i>Megalania prisca</i>	8	22, 19, 18, 17, 12, 12, 4, 1
varanid	2	18, 12
agamid	1-2	18, 7?
snake	1	18
meiolaniid	1	16
chelid	7	25, 18, 16, 12, 12, 7, 3
trionychid	1	19
frog?	1	18
<i>Tandanus tandanus</i>	1	22
teleost	4	18, 17, 12, 9
